

THE SUBSPECIES OF CALOTROPIS PROCERA

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ABSTRACT. The morphological variation and typification of *Calotropis procera* (Ait.) Ait. f. (Asclepiadaceae) is discussed and it is concluded that the taxon found in Pakistan, parts of India and Afghanistan is a distinct subspecies for which *C. procera* subsp. *hamiltonii* (Wight) S. I. Ali comb. et stat. nov. is proposed. Lectotypes of *C. procera* subsp. *procera* and subsp. *hamiltonii* and a topotype for the former are selected.

The genus *Calotropis* R. Br. (Asclepiadaceae) consists of about four species, distributed from the Indo-Pakistan subcontinent to Africa, the West Indies and tropical S America. One of the species, *Calotropis procera* (Ait.) Ait. f. is reported from India, Pakistan, Iran, the Middle East, the Arabian Peninsula, tropical and dry parts of Africa, extending (introduced?) to the West Indies and tropical S America. The author had the opportunity of studying living material in Pakistan and Libya in addition to herbarium specimens from all over the range.

The morphology of plants in vegetative and flowering condition throughout the extensive range is very similar, but a very marked difference was noted in fruit characters of those from Pakistan, parts of India, and Afghanistan, as compared to the more westerly collections. The difference is best explained with the help of diagrams (Fig. 1). In western populations, as exemplified by those from Africa, the length of the fruit varies from 10.8-14.5 cm with a mean of 12.2 cm, and the breadth from 9.7-11.7 cm with a mean of 10.7 cm. The fruit is almost globose and the tip is invaginated at maturity (Fig. 1A), while the width of the air space of the loculus is greater than the central seed-bearing area and the placenta (Fig. 1B). In Pakistan populations the length of the fruit varies from 6.5-9.5 cm with a mean of 7.1 cm, and the breadth from 3.5-5.1 cm with a mean of 3.8 cm. The fruit is shaped like the neckless inverted body of a duck; the tip is not invaginated at maturity (Fig. 1C) and the breadth of the air space is less than the breadth of the central seed-bearing region and the placenta (Fig. 1D). These fruit characters are so distinct that it seems best to regard the two forms as different taxa, and accordingly it becomes important to consider nomenclature and typification.

Calotropis procera (Ait.) Ait. f. (*Hort. Kew.* 2(2):78, 1811) is based on *Asclepias procera* Ait. (*Hort. Kew.* 1:305, 1789). In the 1789 work there is a reference to Herb. Sloane vol. 135 fol. 18 which is in the British Museum (Natural History). This specimen does not have any open flowers or fruits, so it is not possible to determine its exact identity. Though Aiton's *Asclepias procera* is stated to be 'Nat. (ive) of Persia' it is debatable whether Sloane's specimen actually came from Persia. It is not unlikely that this information is taken from Le Brun. pers. p. 315 t. 184, another reference which is also cited in the protologue. Further, there is a reference to Houttyun, *Nat. Hist.* 7, p. 749 t. 44, but this is an illustration of *Calotropis*

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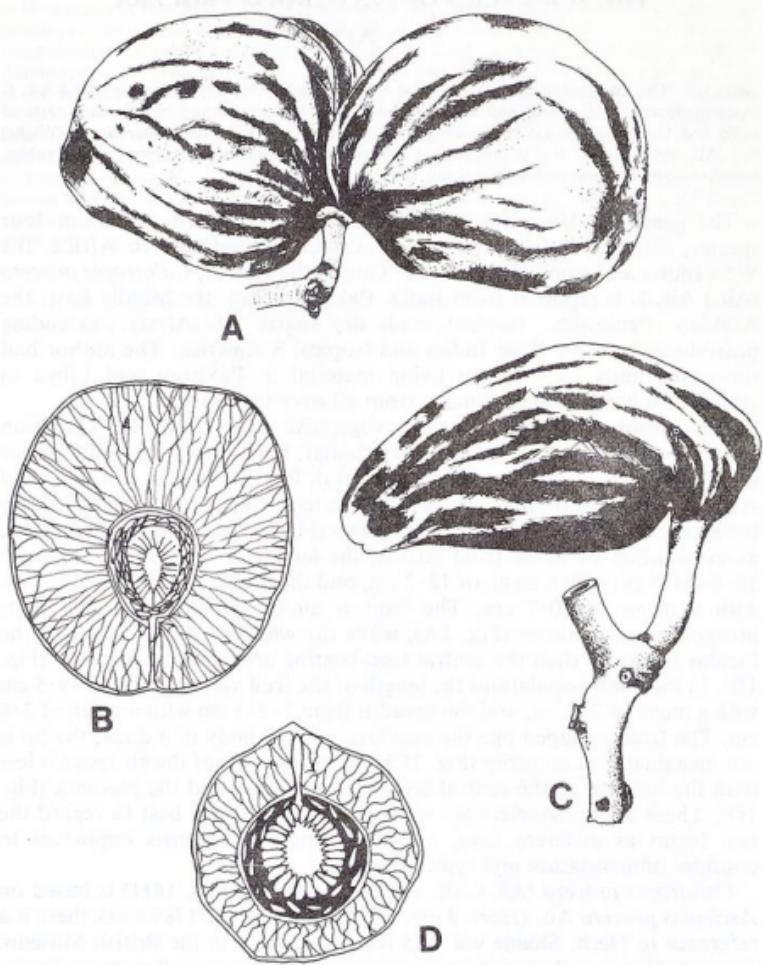


FIG. 1. *Calotropis procera* (Ait.) Ait. f. subsp. *procera*: A, fruits; B, T.S. fruit. *C. procera* subsp. *hamiltonii* (Wight) S. I. Ali: C, fruit; D, T.S. fruit. A & B, \times c. $\frac{1}{2}$, C & D \times c. $\frac{1}{4}$.

gigantea (L.) Ait. f. In addition to these there is a reference to N. J. Jacquin's *Observationum botanicorum iconibus* . . . part 3:17 t. 69.1768 and it is here proposed to accept Jacquin's illustration no. 69 as the lectotype. This illustration does not show any fruits, however Jacquin (*op. cit.*, p. 18) has stated that his illustration is based on material that came from Jamaica. It is therefore proposed to make *W. T. Stearn* 625 (BM) collected from 'Kingston, Palisadoes, along road E of airport, alt. 10 ft, 30 iii 1956' a *topotype*. Thus interpreted, the name *Calotropis procera* (Ait.) Ait. f., based on *Asclepias procera* Ait. is referable to the big-fruited species of *Calotropis* found in Africa and parts of the Middle East, Arabia, West Indies and Tropical America.

The oldest available name for the smaller-fruited eastern taxon appears to be *Calotropis hamiltonii* Wight. In the protologue of this species Wight has cited the following five elements: (i) 'Ham.! herb. n. 777'; (ii) 'Wall. Asclep. n. 92— Asclepias madaree, hort. bot. Calc.'; (iii) In Methilae Magadhae et Cosalaen arenosis, *Hamilton*; (iv) Apud Patna, *Hamilton*; (v) Doab Hindustaniae, *Royle*. There are specimens 'Wallich 92 C—ex Herb. Wight' and 'Hamilton 777' in the Edinburgh herbarium (E). But both these specimens are devoid of fruits. In the general herbarium at Kew I found only one specimen labelled as *Calotropis hamiltonii* Wight—it is from the Royle Herbarium coming from 'N.W. India'. However, in the Wallich Herbarium (under Wallich 8215), there is a specimen labelled as 'Asclepias muddahr' and originating in Calcutta Botanical Garden, bearing the no. 'Ascl. 92 C'. This seems to correspond with element (ii) of the protologue and since it is provided with a fruit, I propose to accept it as a lectotype.

The fruit character indicates that the eastern plants constitute a distinct taxon but does not seem sufficient to warrant recognition at specific level. Since there is a geographical basis to the variation it seems appropriate to recognize the taxon as a subspecies:

***Calotropis procera* (Ait.) Ait. f. subsp. *hamiltonii* (Wight) S. I. Ali, comb. et stat. nov. Fig. 1 C, D.**

Syn.: *C. hamiltonii* Wight, Contrib. Bot. Ind. 53 (1834).

C. procera auct. non (Ait.) Ait. f.; Hook. f., Fl. Brit. Ind. 4:18 (1883).

Lectotype. 'Asclepias muddahr, Ascl. 92 C', Wallich 8215 (K-W).

Distribution. Pakistan, India, Afghanistan, Iran (?), Iraq (?), Oman.

Representative specimens

INDIA. Dehradun and vicinity, 2200 ft, 31 v 1928, *Umrao Singh* 326 (NY). PAKISTAN. Punjab: Lahore, on or near campus Froman Christian College, Lahore, 5 vi 1952, *R. J. Rodin* 5329 (K, RAW); Sialkot-Naowal, 4 iv 1976, *Y. Nasir, Nazir & Fazal Bhatti* 8129 (RAW). N.W.F. Province: Oosterzai Bala, 15 miles from Kohat on way to Hungu, 14 v 1974, *M. Qaiser & S. Abedin* 6091 (KUH); Matani, between Peshawar and Kohat, *M. Qaiser & S. Abedin* 5783 (KUH). Baluchistan: Bolan Pass, common all over, *Griffith* 3761 (K); 100 km south of Quetta, 1800 m, semidesert, 20 vii 1969, *J. S. Andersen & I. C. Peterson* 472 (K); Sind: Hyderabad Div., Miani, x 1911, *S. N. Ratnagar* (K).

AFGHANISTAN. S Nuristan, Laghaman, Nurestan, N of Alingar, alt. 4500 ft, dry rocky ground bordering cultivation and hill slopes, common, 8 vi 1971, *C. Grey-Wilson & T. F. Hewer* 1064 (K); near Bazare Tigr, Laghaman, c. 900 m, rather coarse sandy soil, 19 ix 1969, *L. E. Carter* 670 (K).

SOUTH OMAN. Nemais Wadi, 4 miles from Scib, airport, 21 vi 1973, *Lewis McLeod* 5 (K).

The data for the type subspecies can be summarized as follows:
Calotropis procera (Ait.) Ait. f., Hort. Kew. ed. 2, 2:78 (1811) subsp. *procera* Fig. 1 A, B.

Syn.: *Asclepias procera* Ait., Hort. Kew. 1:305 (1789).

Lectotype: N. J. Jacquin, Observationum botanicorum iconibus . . . part 3: t. 69 (1768)—as *Asclepias gigantea*.

Topotype: Kingston, Palisadoes, along road E of airport, alt. 10 ft, 30 iii 1956, *W. T. Stearn* 625 (BM).

Distribution. Tropical to dry sandy parts of Africa, extending to the Mediterranean belt, Jordan, Arabia, Palestine, Abu Dhabi, West Indies and tropical S and C America.

A large number of specimens from throughout the range of the subspecies has been examined; they are far too numerous to cite here.

The two subspecies probably meet somewhere in the Middle East. It has not been possible to work out the area where they overlap, if indeed they do, because the identity of non-fruiting material is in many cases uncertain.

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